The history and future of African rice: food security and survival in a West African war zone

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Rice farming in the coastal region of West Africa (Cote d'Ivoire to Senegal) developed in ancient times through domestication of African Rice (Oryza glaberrima). Plant breeders have rejected the species for improvement. The panicle morphology (simple branching) seems to limit yield potential, by comparison with Asian Rice (O. sativa), even though African Rice sometimes makes up what it lacks in the panicle with aggressive tillering (production of multiple shoots from a single seed). Working to a plant ideotype defined for SE Asia, rice breeders have tended to select for limited tillering, envisaging a densely planted field treated with fertiliser. On poor soils, in weedy conditions, the morphology of O. glaberrima is viewed positively by West African farmers.

Beginning in the 1950s (with a West African collecting expedition led by H. I. Oka) the Japanese showed considerable interest in African Rice, but apparently mainly in the hope of transferring useful genes to Asian Rice (O. sativa). This interest climaxed in the 1990s when Japanese aid funded the West African Rice Development Association to work on inter-specific hybridisation (Linares 2002, Walsh 2001). Previous attempts to hybridise O. sativa and O. glaberrima were unsuccessful (progeny were largely infertile). Even so, it seems possible that over hundreds of years in which the two species have grown side by side in West Africa some inter-specific out-crossing may have occurred under farmer management. In fact a number of researchers have pointed to the existence of highly adapted 'sativas' in West Africa with morphological features intermediate between the two species (e.g. Jusu 1999). With persistence, and some use of biotechnology, WARDA developed a viable group of intra-specific hybrids (the WARHYB series), some of which have been released as nerica rices.1 In morphology, yield and performance these are Asian Rices modified by genes from O. glaberrima. In general terms, the WARDA strategy builds on a Green Revolution dogma - plants with superior biological characteristics will act independently to transform the socio-economic and socio-political conditions of poor farmers.

A different approach - reflecting more recent debate about livelihoods - seeks first to understand socio-economic and socio-political constraints, and offers agro-technological innovation as a targeted contribution to the release of known constraints. The methodology associated with this approach is participatory plant improvement (PPI). Problems and constraints are identified through interaction with potential users; researchers (working with clients) attempt to target specific problems and constraints (McGuire et al. 1999).

What 'problems' keep O. glaberrima in use, despite alleged morphological deficiencies? An attempt is made in this paper to use data gathered during the recent conflict in Sierra Leone (1991-2002) to specify how O. glaberrima benefits the insecure and marginal rural poor.

An alternative approach to plant improvement

During the 1980s various breeders drew attention to the existence of a cross-over phenomenon in plant improvement (e.g. Ceccarelli 1987, Simmonds 1984, and for a succinct

[1] This paper is a tribute to the life and work of Dr. Malcolm Sellu Jusu, persistent advocate of the neglected virtues of African Rice, and tireless fieldworker for the food security of war-damaged communities in Sierra Leone, who died – shockingly young – in 2005.

review McGuire 2005: 75-6). Local cultivars sometimes out-perform high-yield varieties in low-input conditions. Although a subject of controversy, this cross-over seems real, provided, as McGuire (2005) notes, 'low' is taken low enough. It provides an important technical rationale for PPI, since benefits can only be captured by working in truly low input conditions. The best source for such conditions is farmers' fields. Practitioners of PPI design experiments to involve farmers in selection (Almekinders & Elings 2001, Jusu 1999).

African and Asian Rice in West African conditions seemingly exemplify the cross-over phenomenon in rather stark terms. In 1987 I surveyed rice farms in the village of Kamba in NW Sierra Leone. It was found that 45% of all farm plots were planted to O. glaberrima. But this was not for lack of appreciation of modern Asian varieties. Nearly every farmer planting African Rice also planted one or more Asian Rice types (sometimes improved varieties acquired from research station sources). But the logic of what farmers in Kamba were doing was clear. On over-farmed soils, and in the absence of fertilizer (too expensive to be effective, given the propensity of government to import artificially cheap rice to feed client populations) it made sense to reserve modern Asian varieties for the better soils and to plant O. glaberrima on the weaker soils, where the highly adapted, quick growing and early tillering African Rice shouldered aside the grassy weeds engulfing Asian Rices.

In October 1987 I stood with a farmer from the village of Kogbotuma (in southern Sierra Leone) on a hill overlooking a patchwork of different coloured ripening rices in the valley below. The soil was quite fertile, and the farmer had wanted to use an Asian variety, but ran short of seed when two-thirds of the plot was planted. A friend lent him a variety that had recently spread into the area from the north-west of the country, which turned out to be O. glaberrima, and with which he then completed planting the farm. When the field was ready for weeding the women began working across it in such a way that some of the Asian and some of the African Rice was weeded. They were then called away to a funeral, leaving about a third of the farm, containing both types of rice, unattended. My informant told me he harvested nothing from the un-weeded portion of Asian Rice, but hardly noticed any drop in yield from the weeded and un-weeded sections of African Rice. Although the African Rice yielded less than the weeded portion of Asian Rice he had decided to plant at least some of the African Rice type in all future farms as insurance against sudden loss of weeding labour.

In addition to out-performing higher-yielding Asian Rice in adverse conditions there may be a second reason for taking O. glaberrima seriously. Simmonds (1991) argues that genetic potential for improvement is likely to be found at both ends of a spectrum exploited by breeders only at one end. Plant improvement is a process with a 10,000 year history, and breeders equipped with modern genetic understanding are late arrivals. Among the farmer varieties and land races available for scientific breeding the genetic potential of the commonest and most widespread types has already been captured. Breeders work with unusual material - e.g. the dwarf rices once planted by Japanese farmers only as curiosities - where there is clear high-input/high-output potential. But Simmonds suggests low-input/low-output marginal material may harbour much exploitable genetic potential. In fact, in one provocative paper, he assesses evidence suggesting breeders would do as well working with material they discard (Simmonds 1989).

I first started working with the Sierra Leonean rice breeder Malcolm Sellu Jusu in 1987. In November of that year I visited him in Rokupr Rice Research Station to discuss my field work in Kamba, and took him a small-grained variety with glaberrima morphology. Farmers insisted it was a new kind of rice from Rokupr, greatly valued because it ripened quickly (indeed, its name was 'Three Month Rice' (pa tri mont). Jusu confirmed it as an O. glaberrima type, adding that it was not a station release (there had been no O. glaberrima improvement programme). He presumed that it might have been a discard from an observation trial on local varieties, perhaps acquired by local farmers working as daily labourers on the research site.

He told me he was interested in establishing a plant improvement programme for O. glaberrima in Rokupr, but had been discouraged by the scepticism of colleagues.
Jusu's interest in O. glaberrima was boosted by his experiences trying to run upland trials without fertiliser (a consequence of a foreign exchange crisis). Without fertiliser he could obtain little or no output from Asian Rices. He had collected suitable African Rice cultivars as a result of spending long periods observing farming at first hand, a habit encouraged by his uncle, Gbey Sama Banya, a pioneer Sierra Leonean rice breeder. When I later interviewed the older man in retirement (Richards 1987) he told me he had no formal qualifications, but had been trained 'on the job' by colonial mentors. When the Green Revolution began he was cut out of the international conference circuit through lack of paper qualifications, and chose to spend time in his village in Kailahun, observing farming at first hand. With a sense of what farmers wanted he became a very productive breeder, identifying and improving a number of local selections (mainly by pure line selection). This included the versatile ngiyema yakei (released as ROK 3), today the most widely used variety in central Sierra Leone (see Table 2b, below). These selections from local materials were fertiliser-responsive types of O. sativa. The nephew wanted to go a step further and explore the genetic potential for improvement of African Rice itself.

Participatory humanitarianism

In 1991 a proposal by Jusu, Monde, Richards and others, covering the collection, evaluation and improvement of O. glaberrima, in anticipation of extensive war-induced displacement of farming populations in Liberia and Sierra Leone, was submitted to the European Union directorate for development (summarised in Monde & Richards 1992). The submission was evaluated as 'lacking in scientific interest'. One reviewer added that it was unnecessary, since WARDA planned to focus attention on O. glaberrima. The reviewers ignored the humanitarian implications of the proposed study. Despite this set-back Jusu continued to pursue his interest in the food-security potential of African Rice. Eventually, Wageningen University offered funds for a PhD study comparing the two rice species under farmer management (Jusu 1999).
Opportunities to build on Jusu's PhD findings opened up under the umbrella of a research scheme on the rights of displaced populations sponsored by the Social Science Research Council (USA). This programme, launched in 2000, explicitly called for collaboration of humanitarian practitioners and academic social scientists. Steven Archibald (then of CARE-UK) and Paul Richards (Wageningen University) established an action research partnership with CARE-Sierra Leone around a request by the agency to strengthen its war-zone food security programming. A number of major deficiencies in seeds and tools supply had come to light, and the agency believed a new approach was required.
This new approach was embodied in the 'Rights-Based Food Security' programme (FS-RBA), begun in 2001. The central conception of the FS-RBA programme was that villagers displaced by war had a right to specify the seed inputs they needed to ensure their own food security. Previously, rural populations were obliged to take what agency chose to supply (seeds and tools which were at times unsuitable or of low quality). Identifying and interacting with all potential clients, and taking client seed requests seriously, opened a window to discuss problems associated with earlier input distributions, and to exemplify how the agency saw itself as a duty holder in relation to the right to food. This provided a context in which many social injustices feeding the war came to light (Archibald & Richards 2002).
The EU West African mission funded a trial, and a full programme was later supported by British aid, the EU and other donors. The basic principle of seed supply was that each man, woman or child with a farm plot would be given a starter pack of seed of their choosing

(previously distribution had been based on bulk supply to heads of households, with many households excluded). The area in which the new approach was tried was a lozenge of territory straddling the north-south provincial divide in the centre of the country. The population had been displaced by the rebel Revolutionary United Front in 1995. Some had been assisted to return to their villages by the agency after two or three seasons in displaced camps around the town of Bo. Others (in areas closest to RUF bases) were resettling their villages spontaneously, even as we worked. The project required a total registration of persons in the operational area, including 'stayees' (i.e. those unable to flee to camps).

Typically, 'stayees' lived not in villages but in isolated clearings in the forest known (in Mende) as sokoihun (corners). The sokoihun revived an old settlement pattern. During the interior wars of the 19th century, warriors, defending a main settlement, might hide non-combatants (mainly women and children) in isolated camps, behind a curtain of thick forest, approached along a maze of convoluted tracks replete with ambush points. Some of these sites were natural openings in the forest. Others would have been painstakingly cleared for the purpose. These were more than temporary refuges. It was essential that they produced enough rice to feed the village defenders as well as sequestered 'civil society'.

Some sokoihun were by origin natural marshy areas in the forest enlarged by wallowing elephants. These areas were 'cradles' for forest rice cultivation. Migrating elephants graze rice and spread them from clearing to clearing in their dung. The elephant is locally recognised as a precursor of human habitation (Richards 1993). An entire class of local cultivars is assigned the name helekpoi (i.e. [found in] elephant dung). Even now, sokoihun are recognised not only as temporary refuges but as the kind of place in which to found new settlements, should the need arise.

In the 1950s the forester Donn Small documented the existence of many former sokoihun in the forests bordering Liberia (Small 1953), confirming the Gola reserves as part of the habitable domain, and not 'pristine' rainforest, as they were later classed in conservationist imagination. Many older sokoihun were re-populated during the wars in Liberia and Sierra Leone in the 1990s. Some 'corner' dwellers remained unwilling to leave their refuges until peace took firmer hold.

A problem facing the CARE FS-RBA was that local society had divided between those who retreated with their chiefs towards towns (and camps for the displaced) and those who hid in the sokoihun. The sokoihun populations were often linked - by social origins - with former slave families. Living on the land, in uneasy co-existence (or active collaboration) with a rebel movement rallying the socially excluded, 'corner' dwellers were often suspected (by returning villagers) of complicity with the rebels, and of seeking to usurp the rights and property of the leading families. CARE's earlier distributions had passed through representatives of these families, and few inputs reached 'corner dwellers' (Archibald & Richards 2002a, 2002b).

The FS-RBA was designed to redress this imbalance. It required much effort to reach and register every roadless community in the interior. A practical reason to shift to the starter pack of quality seed was the need for inputs to reach 'corners' where no vehicle could go. Including corner dwellers also meant a greater range of seed types was needed than hitherto. Survival in sokoihun emphasised niche adaptation (Richards 1995). The scheme required especially accurate information on farmer seed requirements. Malcolm Jusu was recruited as consultant, to identify and source client seed requests.

Farmer seed choices under rights-based humanitarianism

The FS-RBA scheme generated a large body of valuable material on the seed choices of populations under adversity (including women and youth). Base-line data (linked to previous

seed collections and inventories during the 1980s) established a pre-war pattern of seed variety use for the major crops requested by resettled farmers. Farmers listed for agency staff the varieties they were currently cultivating, and the seed packet of their choice. More than 90% of requests were supplied. In the few cases where appropriate material could not be sourced, 'second choices' were supplied.
The data show little evidence of genetic erosion due to war; most varieties are available somewhere in the local environment. The seed problem centres on availability at the moment a variety is needed. Pre-war, most farmers gained seed through non-market means, including from patrons or via kinship and friendship networks (Richards 1986). Post-war, few local patrons had seed resources from which to lend (they were still anxiously juggling agency inputs to reinstate a patrimonial modality of seed loans to clients challenged by the war). The division of society into displaced and stayee fractions undermined earlier local patterns of trust and cooperation. Kinship and friendship networks functioned unpredictably. The damage to the social fabric of non-market seed distribution is evident in the reduction of average number of varieties grown per farmer pre- and post-conflict (Table 1).

Table 1: Average number of rice and groundnut types grown per farmer pre- and post-war

	Rice types (per farmer)	Groundnut types (per farmer)
Pre-war	3.8	1.8
Post-war	2.5	1.3

The FS-RBA initiative was highly valued as a way of allowing a divided rural community to address the loss of accessibility to preferred seed types, and as a means of empowering women and youth. Most farmers opted either for rice or groundnuts. A product of the 'democratisation' of seed choice was the surprising number of requests for groundnut seed (39% opted for rice and 61% for groundnuts). Rice is the main subsistence crop in the area, but groundnut can be used either for subsistence or sale. Groundnut farming is especially important for women and youth; 67% of women and 63% of youths chose groundnuts.
But enough women and youth chose rice to bring out a difference in the pattern of variety choices for the two crops. Rice is grown on drylands and in wetlands, and as a self-pollinating crop, responds to farmer selection based on morphology, whereas groundnut is essentially a crop only of freer-draining upland soils. Unsurprisingly, many more types of rice were grown than types of groundnut. The difference of pattern of choices is best brought out by concentrating on the most frequently chosen varieties (Table 2).
Taking the proportion of the eight most important groundnut and rice types accounted for by the top two groundnuts and rices in pre- and post-war plantings by the same farmers provides an index of concentration.2 For rice the index shows only a small increase (5%), apparently nullified by the top eight post-war varieties accounting for a smaller proportion of all rices grown (45%, not 50%). The pre-war index for concentration on groundnut was higher than for rice (60% compared to 39%) and the gap widens post-war (75%, compared to 44%).

Table 2: Pre- and post-war variety use and concentration

Upland Rice	Top varieties (as percent of all varieties)	Main variety	Second variety	Concentration (% accounted for by top two varieties)
Pre-war	8 (50%)	ROK 3	Gbengben	39%

Post-war	8 (45%)	ROK 3	Korkoi	44%

Groundnut	Top varieties (as percent of all varieties)	Main variety	Second variety	Concentration (% accounted for by top two varieties)
Pre-war	8 (100%)	Mares	Babagida	60%
Post-war	8 (100%)	Babagida	Mares	75%

That these differences are real is confirmed by crop choices made by farmers under FS-RBA. Rice choices are again less concentrated than groundnut. The top selections account for c.15% of rice requests and c. 80% of groundnut requests. This is irrespective of gender (i.e. it is not an artefact of allowing more women to choose). When women select rice they select like men. When men select groundnut they select like women (Table 3).
A conclusion is that while farmers seek the best single type of groundnut their selection strategy is different for rice (a difference strengthened by war). The preference for rice is for a portfolio of different types, rather than adoption of a single best type. This finding is significant in the debate between technocratic and participatory plant improvement strategies. A focus on single improved varieties seems appropriate for a more market-oriented crop like groundnut. For a subsistence crop like rice, seed innovations need to be assessed in terms of what they add to the wider portfolio of variety choices. By implication PPI is the better improvement strategy for food security among war affected rice farmers.

Table 3: Range of variety requests, rice and groundnut, by gender (RBA-FS)

	Rice requests	Rice types	Most requested variety (as % of all requests)
Women	121	39	17%
Men	217	45	15%

	Groundnut requests	Groundnut types	Most requested variety (as % of all requests)
Women	356	7	81%
Men	175	4	83%

From data on varieties selected under the RBA-FS scheme and crop varieties planted before and after displacement (Table 4) a further significant finding is derived. For rice and groundnuts, 25% of the respective samples of farmers selected from CARE a seed type they planted last year (i.e. they are 'variety bulkers'). The remaining 75% of groundnut and rice farmers are 'variety seekers'. Of variety seekers 25% of rice farmers and 40% of groundnut farmers chose a variety they had planted before displacement (i.e. they are 'variety recoverers'). Against expectation, 75% of rice farmers and 60% of groundnut farmers sought a variety they had never planted before (they are 'variety innovators'). Their large number is striking, especially for rice. War-affected farmers are more concerned to move on than to hang on.

Table 4: Rice and groundnut requests under RBA-FS, and whether a lost variety is replaced

	A. requested variety plan-ted last year	A1. variety planted last year and planted pre-war	B. requested variety not planted last year	B1. variety not planted last year but planted pre-war	B2. variety not planted last year and not planted pre war
Rice (n=330)	82 (25%)	32 (39% of A)	248 (75%)	62 (25% B1+B2)	184 (75% B1+B2)
Ground -nut (n=518)	131 (25%)	28 (21% of A)	387 (75%)	153 (40% B1+B2)	171 (60% B1+B2)

The data yield a final surprise (Table 5). Having different varieties available for farming is more marked among farmers in off-road than in on-road locations. The impact of the war is apparent throughout the data set, in that all farmers worked with reduced portfolios after the war, but the reduction was less off-road than on. Portfolio rice farming is stronger in off-road localities than on. The enclave is the home of the portfolio.

Table 5: Rice biodiversity, rice varieties per farmer, pre and post-war, by location

	On-road Localities	Off-road localities
After displacement	880 rices, 337 farmers	1051 rices, 366 farmers
- Rices per farmer	- 2.61 rices per farmer	- 2.87 rices per farmer
Before displacement	1171 rices, 323 farmers	1451 rices, 367 farmers
- Rices per farmer	- 3.62 rices per farmer	- 3.95 rices per farmer

The requirements for a technology support strategy for marginalized farmers become apparent. Replacing many inferior types by one or two superior types is dubious. An alternative is to strengthen the portfolio approach. Careful delineation of portfolios, not an abstract ideotype, should be the starting point for food security breeding. If nericas fit the portfolios of war-affected farmers in West Africa this will be good news, but a happy accident. African Rice continues to figure within existing portfolio arrangements, and it remains to be seen whether its role could be enhanced through research. This suggests - as an alternative - working directly with African Rice in a framework of PPI.

Enclave farms (rice cultivation in the shadow of the Zogoda)

Three Month Rice with glaberrima morphology collected in Kamba in 1987 had an interesting subsequent career. A five kilogramme packet was taken to central Sierra Leone in 1988, and

distributed to a handful of farmers who had taken part in earlier on-farm rice trials (Richards 1986). As in Kamba, farmers in Mogbuama and surrounding villages valued the variety for its earliness, and it began to spread locally.

In March 1991, the Revolutionary United Front invaded eastern and southern Sierra Leone from two points north and south of the Gola Forest on the Liberian border. The southern group occupied parts of Pujehun and Bo Districts in mid-1991, before being pushed back across the Moa River by the government army and Liberian irregulars. A German-funded rural development agency - the Bo-Pujehun Project - began rehabilitation operations in the dry season of 1991-2. Three Month Rice seemed a suitable seed type to distribute. Supplies were obtained from two seed merchants in Mogbuama. The rice type was especially successful among those living in sokoihun.

In September 1992 I interviewed farmers in villages around Potoru, the local army garrison. The RUF were active in Soro Gbeima chiefdom, across the Moa. Indeed, one set of interviews was interrupted by speculative fire from across the river. Farmers explained this was the pattern of their life. As fighting flared they hid in the forest in caves and other bolt holes, to resume work in the fields when things seemed quiet.

They rated Three Month Rice as being especially useful, since its aggressive tillering meant it could survive lack of weeding during frequent evacuations, and its tough seed coat deterred birds. During the milk stage it is normal to leave children posted all day on bird scaring platforms, but in periods of heightened insecurity the children were kept secure in the bush. There might be near total loss of other varieties but Three Month Rice survived periods of neglect. Finally, as a quick-ripening type it could be planted with the early rains and harvested in July or August at the height of the hungry season.

The region around the Gola Forest is the main zone for coffee and cocoa growing in Sierra Leone. It was explained that varieties similar to Three Month Rice had been common in the past, but were lost when cocoa cultivation was introduced. As a-photoperiodic types (Dingkuhn & Asch 1999) these lost rices were adapted to early planting in low-lying places just above the swamps, where they tapped available moisture as run off from the first storms of the rainy season. The system is well described for Cape Mount in the 17th century by the Dutch traders who provided the Amsterdam geographer Olfert Dapper with reliable information on this part of the Upper Guinea coast (Jones 1983). From early-mid 20th century cocoa competed for the same soil niche, and a-photoperiodic short-duration glaberrima types disappeared. Three Month Rice, from north-western Sierra Leone, was a welcome re-introduction.

In the dry-season 1993-4 the RUF leadership evacuated its base in Kailahun (Sandeyalu) and built a camp - the Zogoda - to train cadres and securely house the movement's War Council, on the southern ridge of the Kambui Hills forest reserve, just north of Potoru. Life in sokoihun became normal for villagers in its vicinity for the next four years.

Rice cultivation in a rebel enclave (Kholifa Rowalla)

The Zogoda was destroyed by mercenary-supported military action during a cease-fire period prior to the signing of the Abidjan Peace Accord (c. September-October 1996). The Revolutionary United Front abandoned all its remaining forest camps, to join a junta formed when rebellious army officers overthrew the democratically-elected regime of President Ahmad Tejan Kabbah in May 1997. The junta was shortlived, driven out of the capital, Freetown, in February-March 1998 by Nigerian peace-keeping troops, after which the Kabbah government was restored. Thereafter a stalemate resulted with the RUF controlling large swathes of the central-northern part of the country (from Gbendembu in the north-west to the Kono diamond fields in the east, along an axis running through the towns of Makeni and

Magburaka). The RUF were particularly well entrenched in Kholifa Rowalla Chiefdom (Magburaka), the home of Foday Sankoh, the rebel movement's leader.
The entire region became a 'corner'. Restoration of the elected government in 1998 resulted in aid agencies assisting the resettlement of rural populations throughout the south and east, but the RUF enclave in the northern-central part of the country was subject to a government boycott on relief activities. The UN was slow to condemn this use of food as a weapon, an episode described by Porter (2003: 6) as 'one of the most shameful episodes of humanitarian inaction of modern times'. The ban on relief forced rural civilian populations to survive without external inputs for up to five years, providing insights into the dynamics of self-provisioning in enclave conditions comparable to conditions in the rural economy of Biafra during the Nigerian civil war, 1967-70 (Okafor 1981).
Rice farming systems were studied in parts of the future rebel enclave in 1977-1980, and collections of rice varieties were made in Tane Chiefdom, bordering Kholifa Rowalla (Johnny et al 1981). African Rice was present, but accounted for only a small portion of the harvest. Visits to Kholifa Rhowalla and Tane Chiefdoms after the war (2001-2003) suggest that African Rice has now become the dominant (or in some cases the only) rice planted on uplands in interior villages in this part of Sierra Leone.
Farmers in Mayembere village (Kholifa Rowalla) were asked (September 2003) why African Rice was so prominent in a landscape in which Asian Rice had been the main crop during the 1970s. The answers related to insecurity of life in the enclave. People did not want to farm at long distances from the village, under the violent and unstable RUF. The uplands close to villages became over-used and soil fertility declined. Only African Rice was vigorous enough to compete with the weeds.
But in addition to reviving African Rice farmers had developed other innovations. Rice was now intensively inter-cropped with pigeon pea (a leguminous crop). This improved the soil and also yielded a protein-rich foodstuff. A basic local meal is now 'red rice' with a mash of oil palm and pigeon pea. But in any case, as one informant added, this type of rice, although not high-yielding, ripens quicker - 'it shortens the hungry season' (field notes, Mayembere, Tonkolili District, 12 September, 2003). The extent to which survival in the enclave might have been enhanced by the availability of improved O. glaberrima varieties remains a matter of conjecture.

Conclusion

The Green Revolution grew out of a notion that the Cold War might be lost through food shortages and famine (i.e. food crop engineering was deployed as a tool of governance). This technocratic strategy required superior food crops with wide application (so called 'miracle varieties'). The Cold War ended, but international agencies have not yet abandoned the technocratic approach to African poverty (Walsh 2001).
War in West Africa warns that the scenario may have to change. The crisis of African poverty has global ramifications but is deeply rooted in local injustices. This demands a change in the way food security is engineered. If grievances leading to war have local roots then food security - as an antidote - must work in local terms (addressing both local material needs and local injustices). In the war in Sierra Leone some farmers were forced to survive by their own ingenuity, and an analysis of how they survived brings to light the hidden potential of O. glaberrima as a food security crop.
If the excluded are to be supported 'from below' how can relevant technological interventions be devised? War disrupts the access of the marginalized poor to local genetic resources. Post-war reconstruction restores access. This paper has argued that the approach should focus not on seeds judged 'better' in the abstract, but on restoring the agency of rural people, including

the most marginalized. Via the CARE 'Rights-Based Approach to Food Security' villagers were enabled to recover preferred local types in a way that 'modelled' a solidarity-enhancing relationship between rights bearers and duty holders.
When impoverished and war-affected rural populations exercised their right to seed choice some important discoveries were made. Seed requests maintained a wide range of rice planting material, while a few superior genotypes of groundnut sufficed. This accords with expectations raised by the sociology of rice farming in Sierra Leone (e.g. Richards 1986), in which rice must adapt to many ecological niches as well as address a large range of social purposes. 'Low potential' cultivars retain their place in a portfolio of planting choices. Breeders should not assume the role of deciding what constitutes 'high potential' for the poor. This should be a matter for the poor themselves.
A question then arises about crop improvement strategies applicable to West African rice-growing regions undergoing post-conflict recovery. From the perspective of food insecure villagers, improving O. glaberrima through gene tranfers from O. sativa might make better sense than transferring O. glabberrima genes into Asian Rice. In short, the nerica strategy may need to be reversed. This reversal is more than a technical issue. Participation in shaping technology strategy is also important for the recognition it accords to the agency of the poor and marginalised, thus boosting ideas of active citizenship in even the most difficult circumstances. Beneficiary involvement in designing food security options aspires to be an antidote to the fatalism induced by top-down humanitarian and developmental approaches. Bindraban & Rabbinge (2005) deplore the swing in thinking about African agriculture and poverty alleviation from the technology-focused 1970s and '80s to the institutional preoccupations of the present period. They rightly call for a more balanced approach. The present paper argues that balance can sometimes best be achieved by linking institutional and technological development. Why are such options so hard to conceptualise? A basic issue is the global organization of public-interest agro-technology (Scoones 2005). Few people take the sociology of farming seriously, as essential to defining technological policy. The advice, as Fairhead & Leach (2005) suggest, seems too detailed for engineers to grasp. The CARE project showed this constraint could be overcome by deploying technologists with local social knowledge. Alas, the initiative was undermined by rigidities at the policy level. Policy advisers with responsibility for human rights failed to understand the need to keep the approach linked to the technology agenda. When the work was scaled up nationally it was split into components (rights awareness training and food security/agrarian improvement).
The lesson of the sokoihun remains as a challenge to disjointed and inappropriate aid policies. Its social and technological dynamic was one of the basic ways in which rural West African society survived the worst excesses of the slave trade and commercial wars of the pre-colonial period. The evidence remains imprinted on landscape, and embedded in social memory. Sokoihun have regained importance as refuges for sections of rural West African civil society affected by recent wars. It is a pity that the rest of the world, fussing about poverty in Africa, but not often visiting the continent's inner spaces, is so unaware of the technological and sociological versatility that these spaces incubate.

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1 A Sierra Leonean breeder on the WARDA staff, Dr. Monty Jones, was awarded the World Food Prize in 2004 for his work on the nerica series.
2 The maximum number of groundnut types in use was eight; there were about two hundred distinct rice types, planted both pre-and post war. The top eight rices accounted for about half of all rice planted by area.

Zusammenfassung

Der Beitrag untersucht bäuerliche Überlebensstrategien in Sierra Leone unter Kriegsbedingungen, um zu ermitteln, warum Bauern bei Nahrungsmittelunsicherheit auf traditionellen afrikanischen Reis setzen. Afrikanischer Reis hat eine ganz wesentliche Verbindung zu sokoihun (Wald-Enklaven). Diese Enklaven sind in der Landschaftsgeschichte festgeschrieben und erlangten erneut Bedeutung, als in den 1990er Jahren die bäuerlichen Gemeinden in Liberia, Guinea und Sierra Leone durch Krieg überzogen wurden. Die sokoihun lehren, wie endogene Neuerungen selbst unter widrigen Bedingungen entstehen. Bäuerliche, vom Krieg betroffene Gesellschaften könnten von einer genetischen Aufwertung des afrikanischen durch asiatischen Reis profitieren – und damit von einer Umkehr der etablierten Zuchtstrategien. Landwirtschaftliche Strategien zur Armutslinderung profitieren von sorgfältiger Analyse des Umfeldes und vorheriger Konsultation der von Nahrungsmittelunsicherheit Betroffenen.

Schlüsselwörter

Sierra Leone, Ernährungssicherung, Krieg, Landwirtschaft, Reis, Biologische Vielfalt, Agrarwissenschaften, Partizipation

Résumé

Cette étude analyse les stratégies de survie adoptées par le milieu paysan en temps de guerre au Sierra Leone afin de déterminer pourquoi les paysans continuent à apprécier les sortes traditionnelles de riz africain alors qu'ils sont touchés par l'insécurité alimentaire. Le riz africain est lié de manière importante au sokoihun (enclave forestière). Ces enclaves, éléments historiques du paysage, ont à nouveau pris de l'importance avec l'arrivée de la guerre dans les années 1990 au sein des communautés rurales du Libéria, de Guinée et du Sierra Leone. Les sokoihun montrent comment l'innovation endogène se développe même dans des conditions difficiles. Les sociétés agricoles touchées par la guerre pourraient profiter d'une amélioration du riz africain par un apport génétique du riz asiatique et ainsi revenir sur les stratégies institutionnelles de sélection des plantes mises en place. En conclusion, on peut affirmer qu'une amélioration des plantes pro poor pourrait être atteinte en s'appuyant sur des analyses précises des contextes locaux et en consultant préalablement les populations touchées par les pénuries alimentaires.

Mots clés

Sierra Leone, sécurité de l'approvisionnement alimentaire, guerre, agriculture, riz, diversité biologique, agronomie, participation sociale

Abstract

The paper analyses farmer coping strategies under war-time conditions in Sierra Leone in order to identify why food-insecure farmers continue to value African Rice. African Rice has an important association with sokoihun (forest enclaves). These enclaves – written in the history of the landscape – became once again important as war swept over rural communities in Liberia, Guinea and Sierra Leone in the 1990s. The sokoihun teach a lesson about innovation under adversity. War-affected rural populations might benefit from improving African Rice through genetic contribution from Asian Rice, reversing a mainstream institutional breeding strategy. In general, it is concluded that pro-poor plant improvement would benefit from careful contextual analysis and prior consultation with the food-insecure.

Keywords

Sierra Leone, food supply security, war, agriculture, rice, biodiversity, agronomy, social participation